

Claims:

The claims have been amended as follows:

I claim:

1. (cancelled) A machine used for digital communications, comprising:
 - a. a first symbol constellation having at least two symbols, said two symbols having differing amplitudes and each having non-zero probability, and said first symbol constellation having a first second-order statistic and a second second-order statistic, where
 - i. said first second-order statistic is the expected value over all symbols in said first symbol constellation of each symbol multiplied by its complex conjugate and
 - ii. said second second-order statistic is the expected value over all symbols in said first symbol constellation of each symbol multiplied by itself
 - b. a second symbol constellation having a third second-order statistic and a fourth second-order statistic, where
 - i. said third second-order statistic is the expected value over all symbols in said second symbol constellation of each symbol multiplied by its complex conjugate and
 - ii. said fourth second-order statistic is the expected value over all symbols in said second symbol constellation of each symbol multiplied by itself and
 - iii. said fourth second-order statistic is not equal to said second second-order statistic
 - c. means for periodic selection of a symbol from said first symbol constellation
 - d. means for periodic selection of a symbol from said second symbol constellation.

2. (cancelled) The machine of claim 1 further including means for estimating parameters of a linear channel using said second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.
3. (cancelled) The machine of claim 1 further including means for estimating parameters of a linear channel equalizer said second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.
4. (cancelled) The machine of claim 1 further including means for estimating parameters of a nonlinear channel using said second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.
5. (cancelled) The machine of claim 1 further including means for estimating parameters of a nonlinear channel equalizer using said second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.
6. (cancelled) The machine of claim 1 wherein said first second-order statistic of claim 1 is equal to said third second-order statistic of claim 1, further including means for estimating parameters of a linear channel using said second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.
7. (cancelled) The machine of claim 1 wherein said first second-order statistic of claim 1 is equal to said third second-order statistic of claim 1, further including means for estimating parameters of a linear channel equalizer using said second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.
8. (cancelled) The machine of claim 1 wherein said first second-order statistic of claim 1 is equal to said third second-order statistic of claim 1, further including means for estimating parameters of a nonlinear channel using said

second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.

9. (cancelled) The machine of claim 1 wherein said first second-order statistic of claim 1 is equal to said third second-order statistic of claim 1, further including means for estimating parameters of a nonlinear channel equalizer using said second second-order statistic of claim 1 and said fourth second-order statistic of claim 1.
10. (original) A method used for digital communications, comprising:
 - a. periodic selection of a symbol from a first symbol constellation having at least two symbols, said two symbols having differing amplitudes and each having non-zero probability, and said first symbol constellation having a first second-order statistic and a second second-order statistic, where
 - i. said first second-order statistic is the expected value over all symbols in said first symbol constellation of each symbol multiplied by its complex conjugate and
 - ii. said second second-order statistic is the expected value over all symbols in said first symbol constellation of each symbol multiplied by itself
 - b. periodic selection of a symbol from a second symbol constellation having a third second-order statistic and a fourth second-order statistic, where
 - i. said third second-order statistic is the expected value over all symbols in said second symbol constellation of each symbol multiplied by its complex conjugate and
 - ii. said fourth second-order statistic is the expected value over all symbols in said second symbol constellation of each symbol multiplied by itself and
 - iii. said fourth second-order statistic is not equal to said second second-order statistic.

11. (original) The method of claim 10 further including estimation of parameters of a linear channel using said second second-order statistic of claim 10 and said fourth second-order statistic of claim 10.
12. (original) The method of claim 10 further including estimation of parameters of a linear channel equalizer using said second second-order statistic of claim 10 and said fourth second-order statistic of claim 10.
13. (original) The method of claim 10 further including estimation of parameters of a nonlinear channel using said second second-order statistic of claim 10 and said fourth second-order statistic of claim 10.
14. (original) The method of claim 10 further including estimation of parameters of a nonlinear channel equalizer using said second second-order statistic of claim 10 and said fourth second-order statistic of claim 10.
15. (original) The method of claim 10 wherein said first second-order statistic of claim 10 is equal to said third second-order statistic of claim 10, further including estimation of parameters of a linear channel using said second second-order statistic of claim 10 and said fourth second-order statistic of claim 10.
16. (original) The method of claim 10 wherein said first second-order statistic of claim 10 is equal to said third second-order statistic of claim 10, further including estimation of parameters of a linear channel equalizer using said second second-order statistic of claim 10 and said fourth second-order statistic of claim 10.
17. (original) The method of claim 10 wherein said first second-order statistic of claim 10 is equal to said third second-order statistic of claim 10, further including estimation of parameters of a nonlinear channel using said second

second-order statistic of claim **10** and said fourth second-order statistic of claim **10**.

- 18.** (original) The method of claim **10** wherein said first second-order statistic of claim **10** is equal to said third second-order statistic of claim **10**, further including estimation of parameters of a nonlinear channel equalizer using said second second-order statistic of claim **10** and said fourth second-order statistic of claim **10**.